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[REDACTED] EXAMINER

LI, SHI K

[REDACTED] ART UNIT

[REDACTED] PAPER NUMBER

2633

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/909,364	TAN ET AL.	
	Examiner	Art Unit	
	Shi K. Li	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 27 September 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-6,8-17,19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-6,8-17,19 and 20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 07/19/01
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 7 and 18, which correspond to currently amended claim 1 and 8, respective, is withdrawn in view of the newly discovered reference(s) to Wetherell (U.S. Patent 4,723,315). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2-3 and 9-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 depends on claim 1. Claim 1 recites limitation "wherein said polarization rotator is located between said planar waveguide and said polarization beam splitter" in lines 17-18 of the claim while claim 2 recites limitation "said polarization beam splitter is in contact with said first output of said planar waveguide optical coupler" in lines 1-2 of the claim. This is impossible because two things cannot be in contact while there is something else in between. Similarly claim 3 is in conflict with claim 1 and claims 9-11 are in conflict with claim 8.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wetherell (U.S. Patent 4,723,315) in view of Aoki (U.S. Patent 6,542,298 B1).

Regarding claim 1, Wetherell discloses in FIG. 8 an optical detection system comprising a first polarization beam splitter (PBS) for combining an input signal (SO) and a local oscillator (LO) signal, a polarization rotator R_{2x} coupled to a first output of the first PBS (PBS_1), a second PBS (PBS_{2x}), and first and second detector D^2x- and D^2x+ . The difference between Wetherell and the claimed invention is that Wetherell does not teach a planar PBS. However, planar PBS is well known in the art. For example, Aoki discloses in FIG. 10 a planar PBS. Planar PBS can be integrated with other optical components to reduce overall system size and increase system reliability. One of ordinary skill in the art would have been motivated to combine the teaching of Aoki with the optical detection system of Wetherell because using planar PBS reduces overall system size and increases system reliability. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use planar PBS, as taught by Aoki, in the optical detection system of Wetherell because using planar PBS reduces overall system size and increases system reliability.

Regarding claims 6, Wetherell includes in FIG. 8 frequency sensor for generating a signal indicating the difference of the input signal and the local oscillator for controlling the local oscillator.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wetherell and Aoki as applied to claims 1 and 6 above, and further in view of Bouevitch et al. (U.S. Patent Application Pub. 2003/0198437 A1).

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Wetherell and Aoki have been discussed above in regard to claims 1 and 6. The difference between Wetherell and Aoki and the claimed invention is that Wetherell and Aoki do not teach to use walk-off crystal as polarization beam splitter. Bouevitch et al. teaches in paragraph [0032] that walk-off crystal is functionally equivalent to a polarization beam splitter. Where the claimed differences involve the substitution of interchangeable or replaceable equivalents and the reason for the selection of one equivalent for another was not to solve an existent problem, such substitution has been judicially determined to have been obvious. See *In re Ruff*, 118, USPQ 343 (CCPA 1958). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a walk-off crystal as polarization beam splitter in the modified optical detection system of Wetherell and Aoki.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wetherell and Aoki as applied to claims 1 and 6 above, and further in view of Kuwahara et al. (U.S. Patent 5,003,626).

Wetherell and Aoki have been discussed above in regard to claims 1 and 6. Regarding claim 5, Wetherell further includes in FIG. 8, a second output from PBS₁, beam splitter PBS_{2y}, and third and fourth detector D²y- and D²y+. The difference between the modified optical detection system of Wetherell and Aoki and the claimed invention is that Wetherell and Aoki do not teach to use a single PBS for both outputs of the planar waveguide coupler. Kuwahara et al. teaches in FIG. 9 that a single PBS 135 can be used to split two light beams from two output of a coupler. One of ordinary skill in the art would have been motivated to combine the teaching of Kuwahara et al. with the modified optical detection system of Wetherell and Aoki because using a single PBS is cost effective and reduces system size. Thus it would have been obvious to one

of ordinary skill in the art at the time the invention was made to use a single PBS for splitting beams from the two output of the planar waveguide couple, as taught by Kuwahara et al., in the modified optical detection system of Wetherell and Aoki because using a single PBS is cost effective and reduces system size.

8. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wetherell and Aoki as applied to claims 1 and 6 above, and further in view of Yoshida et al. (S. Yoshida et al., "High Resolution Optical Spectrum Analysis by Coherent Detection with Multi-Electrode DBR-LD's as Local Oscillators", IEEE 1994).

Wetherell and Aoki have been discussed above in regard to claims 1 and 6. The difference between Wetherell and Aoki and the claimed invention is that Wetherell and Aoki do not teach to use the modified optical detection system as spectrum analysis. Yoshida et al. teaches in FIG. 1 to use a coherent detection system for optical spectrum analysis. One of ordinary skill in the art would have been motivated to combine the teaching of Yoshida et al. with the modified optical detection system of Wetherell and Aoki because such approach provides large dynamic range and high frequency resolution. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the modified optical detection system of Wetherell and Aoki, as taught by Yoshida et al., because such approach provides large dynamic range and high frequency resolution.

Regarding claim 17, Yoshida et al. teaches in FIG. 1 to use a tunable laser for generating swept local oscillator signal.

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9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wetherell, Aoki and Yoshida et al. as applied to claims 8 and 17 above, and further in view of Bouevitch et al. (U.S. Patent Application Pub. 2003/0198437 A1).

Wetherell, Aoki and Yoshida et al. have been discussed above in regard to claims 8 and 17. The difference between Wetherell, Aoki and Yoshida et al. and the claimed invention is that Wetherell, Aoki and Yoshida et al. do not teach to use walk-off crystal as polarization beam splitter. Bouevitch et al. teaches in paragraph [0032] that walk-off crystal is functionally equivalent to a polarization beam splitter. Where the claimed differences involve the substitution of interchangeable or replaceable equivalents and the reason for the selection of one equivalent for another was not to solve an existent problem, such substitution has been judicially determined to have been obvious. See *In re Ruff*, 118, USPQ 343 (CCPA 1958). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a walk-off crystal as polarization beam splitter in the modified optical detection system of Wetherell, Aoki and Yoshida et al.

10. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wetherell, Aoki and Yoshida et al. as applied to claims 8 and 17 above, and further in view of Kuwahara et al. (U.S. Patent 5,003,626).

Wetherell, Aoki and Yoshida et al. have been discussed above in regard to claims 8 and 17. Regarding claim 13, Wetherell further includes in FIG. 8, a second output from PBS₁, beam splitter PBS_{2y}, and third and fourth detector D²y- and D²y+. The difference between the modified optical detection system of Wetherell, Aoki and Yoshida et al. and the claimed invention is that Wetherell, Aoki and Yoshida et al. do not teach to use a single PBS for both

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outputs of the planar waveguide coupler. Kuwahara et al. teaches in FIG. 9 that a single PBS 135 can be used to split two light beams from two output of a coupler. One of ordinary skill in the art would have been motivated to combine the teaching of Kuwahara et al. with the modified optical spectrum analysis system of Wetherell, Aoki and Yoshida et al. because using a single PBS is cost effective and reduces system size. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a single PBS for splitting beams from the two output of the planar waveguide couple, as taught by Kuwahara et al., in the modified optical spectrum analysis system of Wetherell, Aoki and Yoshida et al. because using a single PBS is cost effective and reduces system size.

Regarding claim 14, Wetherell includes in FIG. 8 frequency sensor for generating a signal indicating the difference of the input signal and the local oscillator for controlling the local oscillator.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wetherell, Aoki, Yoshida et al. and Kuwahara et al. as applied to claims 13-14 above, and further in view of Araki et al. (U.S. Patent 6,640,042 B2).

Wetherell, Aoki, Yoshida et al. and Kuwahara et al. have been discussed above in regard to claims 13-14. The difference between Wetherell, Aoki, Yoshida et al. and Kuwahara et al. and the claimed invention is that Wetherell, Aoki, Yoshida et al. and Kuwahara et al. do not teach a fiber holder. Araki et al. teaches in FIG. 19 a fiber holder. One of ordinary skill would have been motivated to combine the teaching of Araki et al. with the modified heterodyne detection system of Wetherell, Aoki, Yoshida et al. and Kuwahara et al. because the fiber holder of Araki et al. secures a number of fibers at predetermined intervals while maintaining high

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density (see col. 2, lines 64-65). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a fiber holder, as taught by Araki et al., in the modified heterodyne detection system of Wetherell, Aoki, Yoshida et al. and Kuwahara et al. because the fiber holder of Araki et al. secures a number of fibers at predetermined intervals while maintaining high density.

12. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wetherell, Aoki and Yoshida et al. as applied to claims 8 and 17 above, and further in view of Tsunetsugu et al. (H. Tsunetsugu et al., "A Packaging Technique for an Optical 90°-Hybrid Balanced Receiver Using a Planar Lightwave Circuit", IEEE Transactions on Component, Packaging, and Manufacturing Technology – Part B, Vol. 19, No. 3, August 1996).

Wetherell, Aoki and Yoshida et al. have been discussed above in regard to claims 8 and 17. The difference between Wetherell, Aoki and Yoshida et al. and the claimed invention is that Wetherell, Aoki and Yoshida et al. do not teach to a lens between the PBS and optical detectors. However, it is well known in the art to use lens to focus light beam for efficiency. For example, Tsunetsugu et al. teaches in FIG. 2 to use GRIN rod lenses between beam splitter and photoreceivers. One of ordinary skill in the art would have been motivated to combine the teaching of Tsunetsugu et al. with the modified optical spectrum analysis system of Wetherell, Aoki and Yoshida et al. because lenses provides perfect coupling efficiency. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include lenses between beam splitter and detectors, as taught by Tsunetsugu et al., in the modified optical spectrum analysis system of Wetherell, Aoki and Yoshida et al. because lenses provides perfect coupling efficiency.

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13. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wetherell and Aoki as applied to claims 8 and 17 above, and further in view of Lange et al. (U.S. Patent 6,748,179 B2).

Wetherell, Aoki and Yoshida et al. have been discussed above in regard to claims 8 and 17. The difference between Wetherell, Aoki and Yoshida et al. and the claimed invention is that Wetherell, Aoki and Yoshida et al. do not teach to use filter for attenuating input signal. Lange et al. teaches in FIG. 5 to use a tunable filter to monitor or analyze spectrum for each channel for a WDM system. One of ordinary skill in the art would have been motivated to combine the teaching of Lange et al. with the modified spectrum analysis system of Wetherell, Aoki and Yoshida et al. for WDM applications. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a tunable filter for attenuate unwanted channels, as taught by Lange et al., in the modified spectrum analysis system of Wetherell, Aoki and Yoshida et al. because it allows the system to be used for WDM applications.

Response to Arguments

14. Applicant's arguments with respect to claims 1-6, 8-17 and 19-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

skl

M. R. Sedighian
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